

**Integration Forest/Mill/R&D/Commercialization:  
a need not always fulfilled  
in the pulp and paper value chain**



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**The presentation has the objective to discuss the lack of tuning among several key areas in the process of developing, manufacturing, trading and supplying good quality pulp & paper products to the market.**

**The focus is to make visible the common mistakes the companies in general have when dealing with this issue, and the main constraints to turn integration into a sound reality. The role of suppliers/customers is emphasized in the success of this productive chain. The presentation is based on the author's experience on this subject, taking the eucalyptus pulp and paper manufacturing sector as an example.**

**Value chain  
or  
Chain of complaints**



**Integration must be understood  
as a very important  
management tool, and not as a  
simple technical forum that  
managers are not responsible  
for caring**

# Today:

**⇒ pulp and paper machines are faster, larger, cleaner and a lot more sensitive to changes**

**⇒ paper quality requirements are a lot stricter (moisture, dimensional stability, curl, porosity, bulk, caliper, etc)**

# Today:

**⇒ top managers are more demanding on cost control, operational efficiency, and performances**

**⇒ market is more demanding and very very volatile**

# Company's strategies

- Survival
- commodity oriented
- niche oriented



- Growth and Development
- commodity oriented
- niche oriented



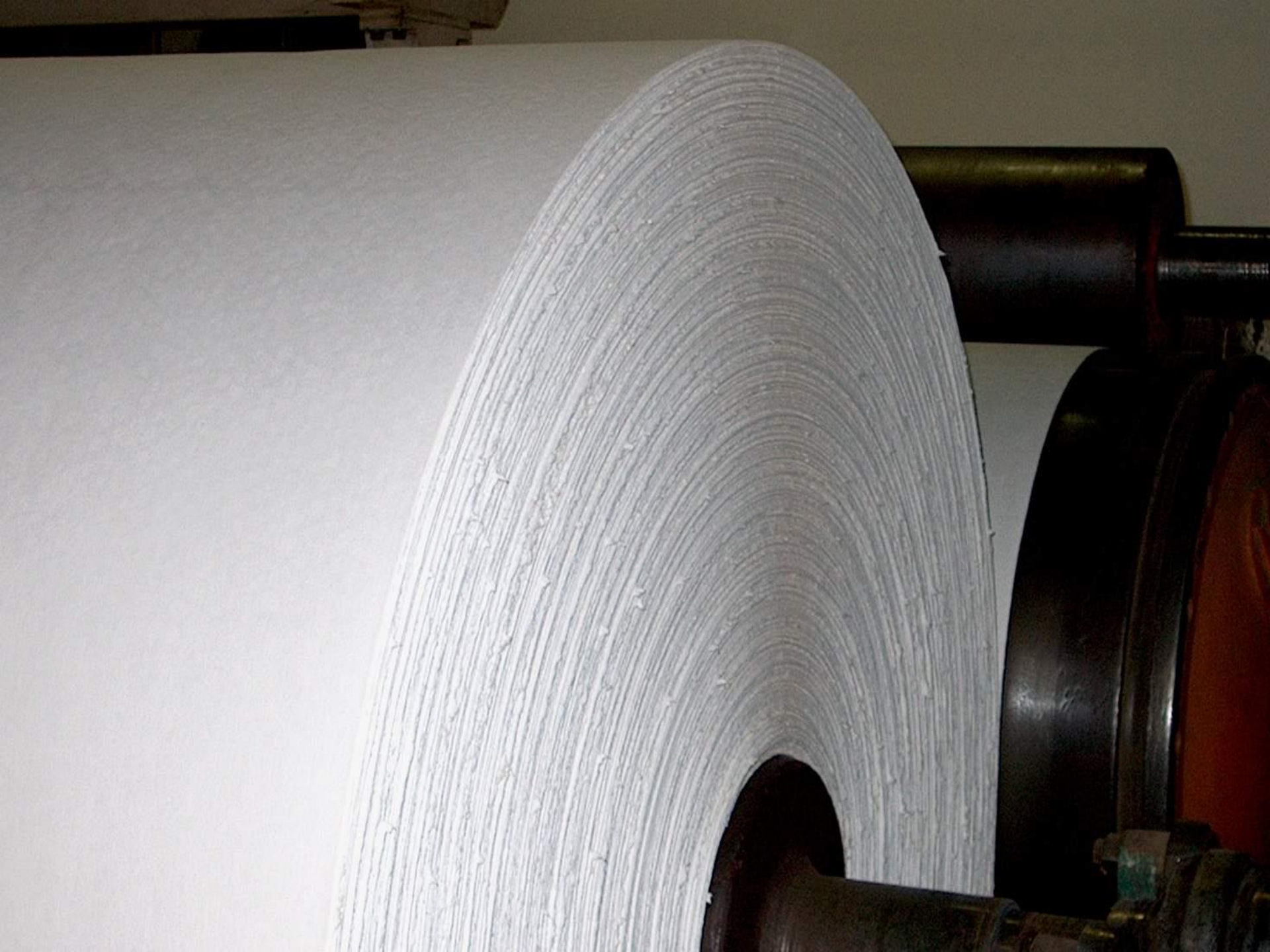
- **In both strategies, the management are different, and different will the required human resource profile**

**•In both cases, the pressures over the wood will be the same: quantity and cost, no matter whether available or not**

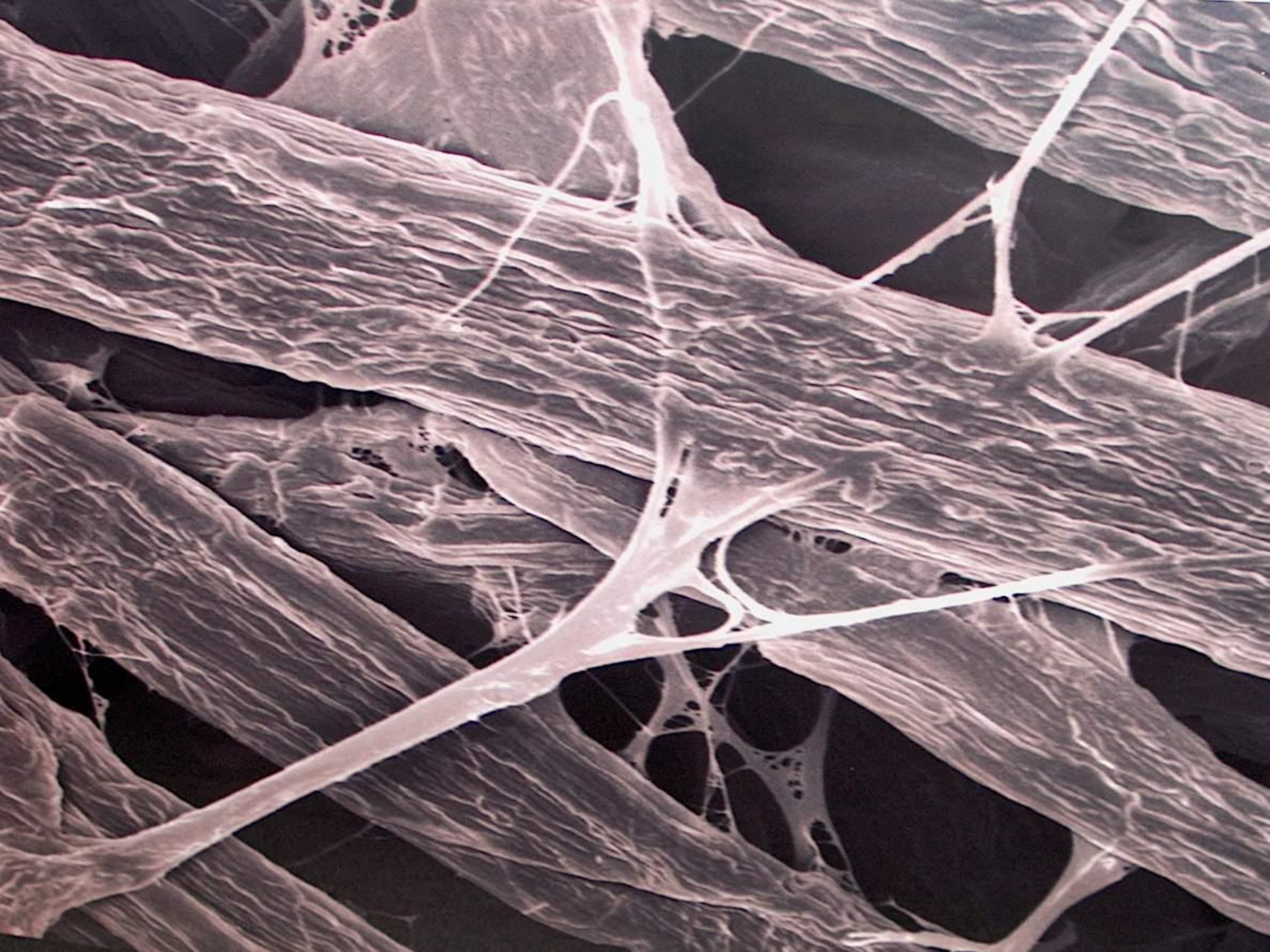


**Wood production and wood supply are core sectors in the value chain, but in general they are not understood as such by top management**



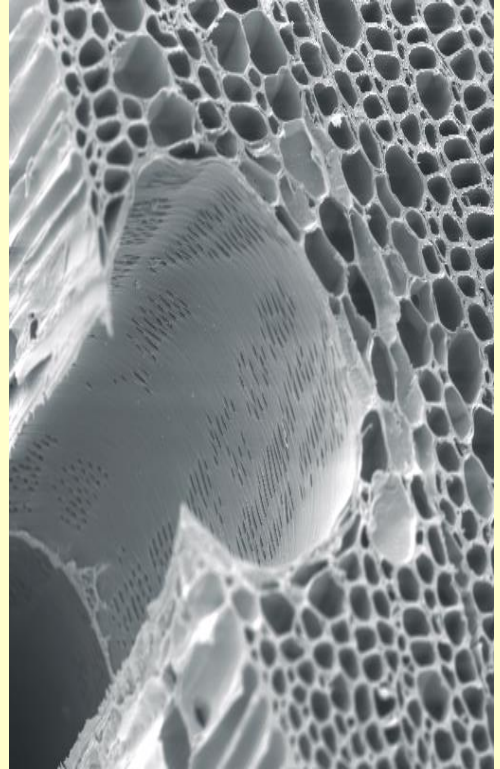






**Wood price as a standing tree is kept low and it does not bring incentive to local farms to grow good quality forests**





**Good quality genomes are not transferred to farmers with the belief that these superior trees will be copied and used by the competition**







**It is a must to managers to keep  
wood as a low cost raw material  
at the mill doors.**

**However, what do you mean by  
low cost wood?**







**Investments in wood storage,  
wood chipping, wood handling  
are usually at the minimum,  
most of the time, in most of the  
mills**



**Money in general is oriented to machines, boilers, digesters, etc. In the forestry area it goes to tree breeding ( a far away future )**















**Wood sector is a gray area  
between forestry and mill  
industrial site.**

**Customer chain is many times a  
forgotten issue.**

**“Future expectations are not  
today’s results”**

**“The difference between the talk  
and the reality”**

**Wood losses as residues are  
amazingly high from forest to  
customers (wood , fibers and  
broke)**







**Wood blends are the most traditional way to manage variability and to try to transform non-uniform wood supply into a sound and uniform mill performance**

**Paper mills manufacturing single product are very sensitive to wood supply.**

**The best to them is an effective control of wood blend.**

**Market pulp mills may have two options by controlling fibrous raw material supply:**

**# Single product**

**# Specialty pulps**

**At what costs, what margins and net profits ?**





**To add value does not  
necessarily mean to add profits.**

**Due to low quality chips, digester knots and rejects are high in the brown pulp (1.5 - 3%) and when recycled, they occupy room in the digester volume, a room that could be used by fresh wood chips to raise production.**

**Pulp production is definitively affected by wood quality in terms of digesting ( liquor demand, yield); washing, screening, solids to recovery boiler, contaminants (pitch, sand, soil, etc), bleaching, drying, etc**

**Paper production is very much affected by wood quality: screening, refining, formation, drainage in the wet end, energy and steam consumption , chemical consumption, breaks in the dry and wet end, broke generation, machine operational performance, optical brightener addition, strengths, etc**

**Customers, both from market pulp or paper products, are affected by the quality of the wood supply**

## Care with logs is second class:

⇒ dirt logs come to the mill bringing contaminants (soil, leaves, branches, stones, etc)

⇒ deteriorated wood is generally part of the wood supply by lack of appropriated planning of harvesting and stocking

## Care with wood is second class:

⇒ logs are in general smashed and broken in parts due to inefficient drum debarkers ( very low efficiency) and they are sent to the manufacture of second class chips with high bark content

⇒ wood chipping and screening are most of the times bottlenecked and the result is a poor quality chips to the digester







## Care with wood is second class:

⇒ wood cost is a hidden issue, due to wood losses both in forest and at the mill. Good wood is also transferred to biomass boilers, in a recycling measure that costs a lot, but does not add visibility to total wood costs

⇒ wood chips are more expensive than biomass, but this is very often not visible













# The Ten Management Rules









# Rule # 1: Management of wood supply



**“from forest site to paper customers”**

# Rule # 2: Management of quantity



**“To guarantee a uniform chip bulk density to digester to keep operation stable in terms of liquor dosage, wood feeding, pulp daily production, etc.”**

# Rule # 3: Management of variability



**“The challenge is to tame the variability”**

# **Rule # 3: Management of variability**

- **efficient and uniform blends**
- **minimum two lines of chipping to adapt each line to a particular wood quality ( for example: one line with *E.globulus* and another with *E.nitens*)**

# **Rule # 3: Management of variability**

## **Wood quality:**

- **species / age**
- **moisture**
- **basic density**
- **residual bark**
- **wood extractives**
- **total dissolved solids in black liquor**

# **Rule # 3: Management of variability**

## **Fiber quality:**

- **fiber population**
  - **coarseness**
    - **fineness**
    - **vessels**
- **Water Retention Value**
  - **Zero Span tensile**



# **Rule # 3: Management of variability**

## **Fiber quality:**

- viscosity**
- pitch**
- hemicelluloses**
- electronegativeness**
- zeta potential**
- pH**

# **Rule # 3: Management of variability**

## **Fiber quality:**

- **calcium ion content**
  - **pulp refining**
- **energy consumption**
- **water absorption**

# **Rule # 4: Management of the quality of wood supply**

- bark**
- chip quality**
- fines / sawdust / oversized chips**
- moisture**
- bulk density**

# Rule # 5: Management of pulping process



- cooking
- screening
- bleaching
- recovery boiler



# **Rule # 6: Management of the paper manufacturing process**



- refining
- drainage
- retention
- chemicals added
- wet pressing
  - sizing
  - drying
- calendering
- coating

# Rule # 7: Broke management

- Quality control
- Fixed and controlled addition



# **Rule # 8: Management of process changes**



- program
- planning
- follow up
- speed of changes
- vital indexes to follow
- identification of constraints

# **Rule # 9: Management of uniqueness**



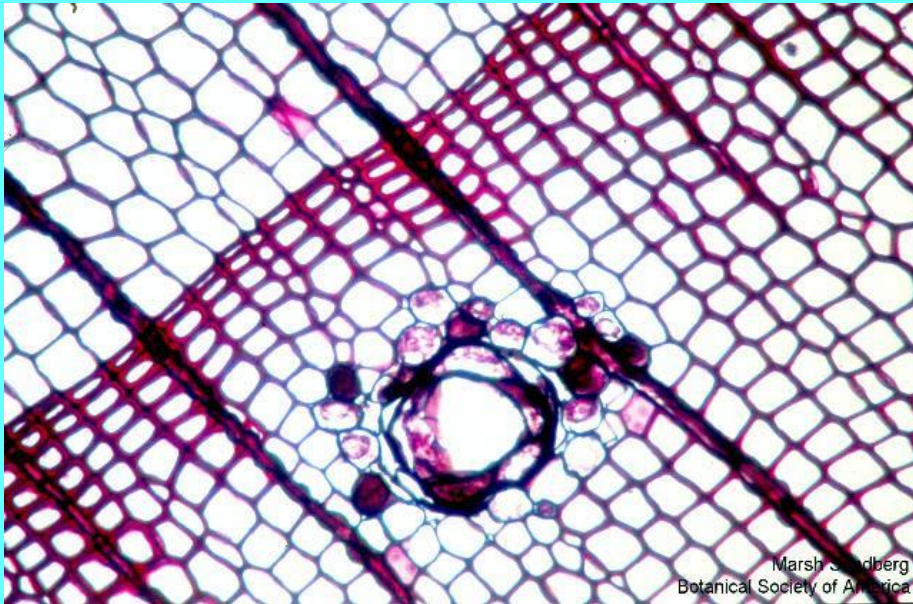
**•Separation of different wood quality to different products:**

- tissue grades**
- printing and writing grades**
- packaging grades**



# **Rule # 9: Management of uniqueness**

**“It is not that simple,  
since very affected by  
bottlenecks”**



Marsh Sandberg  
Botanical Society of America

# **Rule # 10: Management of human resources, mainly vanities**

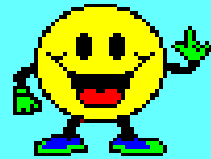
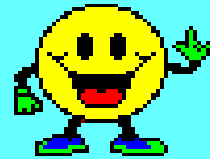
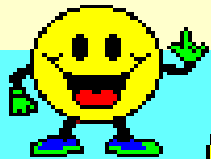
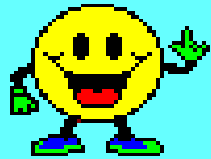
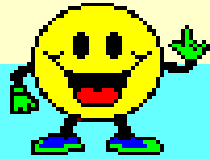
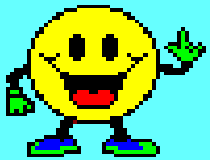
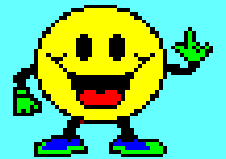
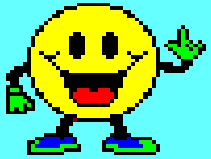
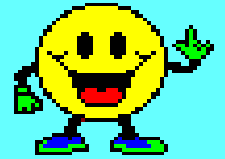
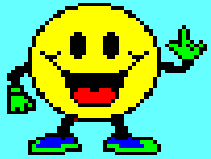
**“It is also not that simple, depends mainly on you”**





# Final suggestion:

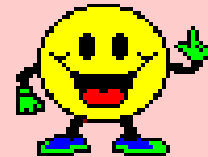
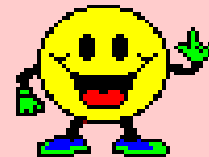
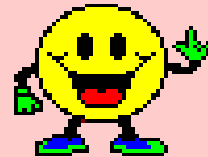
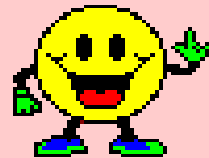
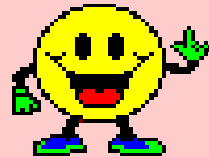
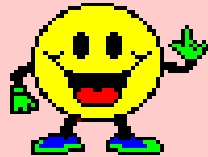
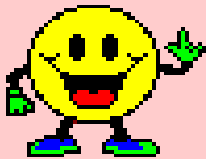
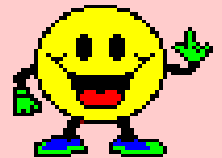
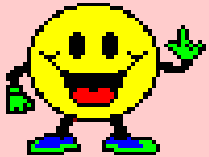
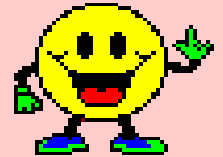
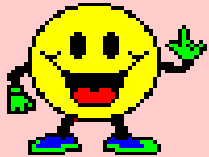
To develop a team with  
global view, from forest to  
customers, to act as a source  
of knowledge and good will  
to perform a sound  
management in terms of  
decisions in the value chain





# Final suggestion:

**Work hard to fight  
conflicting information and  
ideas/concepts, improving  
management efficiency,  
human relations, process  
efficiency and overall  
reliability**

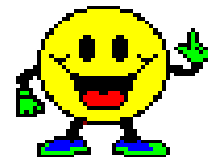
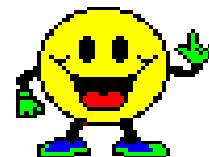
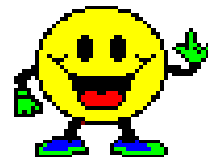
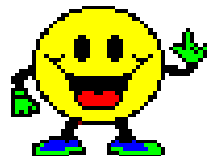
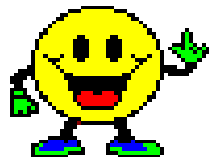
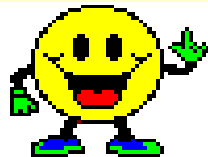
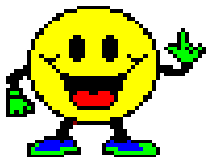
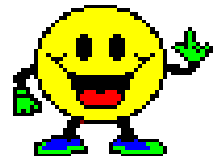
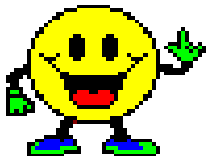
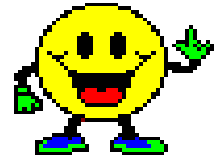
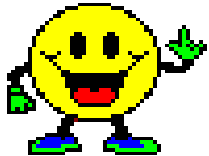






# Integrated team

- Forestry
- Pulp mill
- Paper mill
- Commercial sector
- R&D
- Costs
- Logistics







**Good Luck**